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Mass Propagation of *Danio aequippinatus*, an Ornamental Fish of North Eastern India

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Abstract

North eastern region (NER) of India harbours 266 species of fishes out of which 196 have potential ornamental value. The present paper incorporates the technique of mass propagation of indigenous ornamental fish species with *Danio aequipinnatus* as the test species. For successful mass propagation of *D. aequipinnatus*, selection of brood stock, food and feeding schedule and breeding set-up are important criteria. Maintenance of physic- chemical parameters of the breeding tank is important in the survival of the breeders. Best fertilization rate are obtained with 3:2 male to female ratio.

Keywords: Mass propagation; *Danio aequipinnatus*

Introduction

The hobby of keeping ornamental fish has expanded into a booming international trade. 85% of ornamental fish from north eastern region are exported to the global market and all are traded on wild catch. The commercial organized export of freshwater ornamental fish depends primarily on assured and adequate supply as and when demand arises [1]. Although some studies have been done by the earlier workers on food, nutrition and rearing of some ornamental freshwater fishes viz., 18; 11; 14; 2 and 17. It was indeed 7; 15; 16 and 13 who made empirical studies on the breeding of some native ornamental fish species of N.E. India hitherto remain [2]. Looking at the present scenario of ornamental fish trade of NER, the present paper accentuates the technique of mass propagation of indigenous OFS D. *aequipinnatus* a classified ornamental fish of NER in particular for the benefit of entrepreneurs in ornamental fish trade [3].

D. aequipinnatus (McClelland) commonly known as 'Giant Danio' has brilliant colouration of basic blue with mixture of silvery tinge. Three alternate bluish and thinner golden yellowish bands run along the caudal peduncle to post opercular region. Due to its brilliant colouration the test species has a high demand among domestic and international ornamental fish traders [4]. The species is semi- torrential and inhabits rocky stream with medium water current. Mainly solitary species but may be found in school of 15-25 individuals. Since semi-torrential the species can withstand wide range of temperature fluctuations.

Materials and Methods

The target fish species were collected from streams of Assam and Meghalaya. The collection stations were Basistha and Bahini hillstream, Kopili stream, Kalpani stream, Sukurboria stream at Rani Garbhanga Reserve forest of Kamrup District. For rearing of breeders dechlorinated tap water treated with 5% methylene blue for 2-3 days were used. Methylene blue acts as a disintefactant [5]. Glass tank of the size 60 × 45 × 45 cm and 60 × 30 × 30 cm were used to rear male and female brooders separately. Both corner and under gravel filters are used with artificial oxygenation for 24 hours. The fecal matter and uneaten food particles of the tank were siphoned out every day and the water was partially changed every two days. The corner filter was also cleaned every alternate day. The important criteria for laboratory propagation of fresh water native ornamental fish are selection of breeders, maintenance of breeders, stocking density of breeders, breeding set up and breeding technique [6]. Reports on the reproductive biology of OFS of North-eastern India are meager and mainly restricted to [7-9].

The breeders were selected after [10,11]. Maintenance of the brooders, stocking density, breeding setup and breeding technique were made after [12]. Food is a major component for the maintenance of brooders. Both natural (live) and artificial (formulated) food was supplied for maintenance of brooders. The stocking density of the brood stock was calculated through surface dimensions and surface area [13]. If the surface area is 60 × 30 cm=1800 sq.cm, the recommended level was obtained by dividing the surface area by 13 and in 60 × 45 cm=2700 sq.cm. the dividing factor was 20.

Results

Selection of brood stock

For breeding, female brooders of size 72 mm in length and male of 74.6 mm were selected and kept separately in the brood rearing tanks and monitored constantly. The water temperature was maintained as between 18.0-21.0°C and 24.0-25.00°C, pH between 7.7-8.0 and 7.1-7.5, Dissolve oxygen(DO) (mg/l) between 5.2-5.5 and 5.0-5.1, Total alkalinity (TA) (mg/l) between 83.0-92.0 and 72.0-74.0, Total hardness (TH) (mg/l) between 14.0-16.7 and 18.5-20.0 during winter and summer respectively. The water analysis was done as APHA, 1986. The water volume (l) was maintained at 60-80 cm and depth at 15-20 cm. The bottom of the aquarium was scattered with small stone chips. The food comprised of both live as well as formulated food. Live food consisted of mosquito larva, blood worm and tubifex which were supplied at the rate of 6% and 5% per body weight respectively at every 8 hours and formulated feed were supplied at the rate of 8% per body

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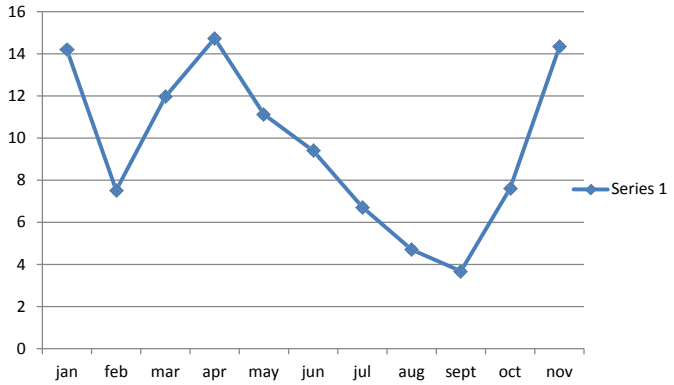

Figure 1: Average GSI of *D. aequipinnatus*.

weight at every 12 hours. The suitable stocking density level was found to be 1 fish/135 sq.cm.

The Gonado Somatic Index (GSI) of the species indicates two breeding seasons, the first season being November to January and the second breeding season being April. The spawning habitat was created by placing small mosaic chips of size 10-12 mm or small glass beads of size 15 mm diameter on the bottom of the breeding tank [14]. Corner filter with feeble aeration was also supplied. The suitable breeding ratio for captive breeding of the test species was found to be 3:1 (male: female) but 3:2 ratio also yields good results. The gravid female was introduced first into the breeding tank. The males were introduced 18-20 h after the female was introduced. Courtship display continues for 4-6 h after which the female spawns and the eggs are scattered into the bottom of the tank. Both male and female were removed from the breeding tank after spawning is completed [15-18]. The maximum number of hatchlings calculated in 3:2 (male: female) ratio were 210 whereas 170 numbers of hatchling were recorded in 3:1 (male: female) ratio (Figure 1).

Discussion

Nutrition is an important factor and there was a preference for blood worm and tubifex over mosquito larva. As for formulated feed, the application level was scaled down to @5-8% per body weight from the recommended level of 10% per body weight showing no adverse affect in either growth or survivality of brooders [15-18].

Conclusion

It was observed that *D. aequipinnatus* could be successfully bred in medium sized glass tank with a bed prepared from small mosaic chips which gave better spawning performance. Indeed an optimum temperature level for breeding of daniids at 27.0°C, could be established in the present empirical investigation.

The present investigation also revealed the optimum combination of male and female breeders for successful breeding in the test OFS. This ratio was ascertained as 3:2 hitherto remained unreported.

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